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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/560,621

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Hiromune Matsuoka

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22919 7590 06/22/2009  
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EXAMINER

COX, ALEXIS K

ART UNIT

PAPER NUMBER

3744

MAIL DATE

DELIVERY MODE

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/560,621	<b>Applicant(s)</b> MATSUOKA ET AL.	
	<b>Examiner</b> ALEXIS K. COX	<b>Art Unit</b> 3744	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 16 April 2009.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 6-8 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 6-8 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

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4. Claims 6-8 are rejected under 35 U.S.C. 103 (a) as being unpatentable over Spauschus (US Patent No. 4,417,451) in view of Olson (US Patent No. 2,100,867) and Roessler (US Patent No. 2,066,161).

Regarding claims 6-8, Spauschus teaches a vapor compression refrigerant system comprising a heat source heat exchanger (13, see column 4 line 13); a utilization side heat exchanger (15, see column 4 lines 13-14); a liquid side refrigerant circuit connecting the heat source side heat exchanger and the utilization side heat exchanger (15, 13, 17, 14 and connecting pipes, see column 4 lines 14-17); a heat source side expansion valve (14, see column 4 lines 17-18) being connected to the liquid side refrigerant circuit (see column 4 line 17); and a gas separation apparatus (17, 21, 24, 20, 22, 23, see column 4 lines 30-44, see also figures 2-4) being configured to connect the heat source side heat exchanger and the utilization side heat exchanger (see figure 1), the gas separation apparatus including a separation membrane (24, see column 4 lines 36-37) being connected to the liquid side refrigerant circuit (see figure 1), the separation membrane being configured to separate from the refrigerant a noncondensable gas and the gas separation apparatus being configured to discharge out of the liquid side refrigerant circuit a noncondensable gas remaining inside a refrigerant connecting pipe (20, see column 4 lines 35-36), the separation membrane's function being enhanced by operating a compressor and circulating the refrigerant inside the liquid side refrigerant circuit. Figure 1 of Spauschus further teaches the refrigeration apparatus to include a receiver (17, see column 4 line 16) in the liquid side refrigerant circuit, the receiver being configured to accumulate the refrigerant flowing

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between the heat source side heat exchanger and the utilization side heat exchanger, the gas separation apparatus being connected to the receiver and configured to separate the noncondensable gas contained in a gas phase of the refrigerant accumulated in an upper part of the receiver. Additionally, figure 1 of Spauschus teaches the gas separation apparatus to include a discharge valve (22, see column 6 line 67) configured to release the noncondensable gas into the atmosphere after separation. It is noted that Spauschus does not disclose the presence of a four-way switching valve being configured switch a direction of a refrigerant when changing between a cooling operation and a heating operation or a bridge circuit having a first, second, third, and fourth check valves. Olson explicitly discloses a bridge circuit composed of four solenoid valves (29, 31, 43, 42, see column 2 lines 9, 11, and 40; see also figure 1), which will result in connection to the upper end of the segment of the refrigeration equipment it is attached to. Roessler discloses a reversible refrigerating system with a four-way switching valve (23, see page 2 lines 17-24) and four check valves (30, 39, 35, 47, see figure 1) forming a bridge circuit around a receiver (34, see page 1 right column lines 14-15). As the systems of Spauschus, Olsen, and Roessler are similar in structure and function, it would have been obvious to one of ordinary skill in the art at the time of the invention to implement the four-way switching valve of Roessler, and the bridge circuit arrangement of Olsen implemented with the check valves of Roessler, in the system of Spauschus, in order to combine reversibility of the system via the four-way switching valve with the one-way operation of the receiver made available by the bridge circuit of Olson, and the reduced leakage and less

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expensive parts of the simple check valves of Roessler, in order to reduce the cost while improving the effectiveness of the system of Spauschus.

### ***Response to Arguments***

5. Applicant's arguments with respect to claims 6-8 have been considered but are moot in view of the new ground(s) of rejection.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ALEXIS K. COX whose telephone number is (571)270-5530. The examiner can normally be reached on Monday through Thursday 8:00a.m. to 5:30p.m. EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frantz Jules can be reached on 571-272-6681. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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/AKC/

/Frantz F. Jules/  
Supervisory Patent Examiner, Art Unit 3744